Nome: Guilherme Rabeca Valino Reis.
Prof: Oswaldo José de Almeida
Lista 5 - Cálculo

$\frac{dx}{dt} = \frac{d}{dt}(5\cos t)\,dt = -5\operatorname{sen} t\,dt$

$\frac{d}{dt}(5\operatorname{sen} t)\,dt = 5\cos t\,dt$

$ds = \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}\,dt$

$ds = \sqrt{(-5\operatorname{sen} t)^2 + (5\cos t)^2}\,dt.$

$ds = \sqrt{25\operatorname{sen}^2 t + 25\cos^2 t}\,dt = \sqrt{25}\,dt = 5\,dt$

$\int_C 2xy\,dx.$

$\int_0^{\pi/4} 2(5\cos t)(5\operatorname{sen} t)(-5\operatorname{sen} t)\,dt$

$= 250\cos t \operatorname{sen}^2 t\,dt.$

$-125\sqrt{2} + 625\sqrt{2}$

$\frac{500 - 125\sqrt{2}}{6}$

$\frac{125}{2}$

Digitalizado com CamScanner

(02) $\int_C (2\bar{z} - z)\,dz$, onde $C: x = -t$, $y = t^2 + 2$, $0 \le t \le 2$

$z = x + iy \Rightarrow z = -t + i(t^2 + 2)$

$1 + \text{cm}(2t)$

$$\int_0^2 (t - 2t^3 - i2t)\,dt = \int_0^2 (-2t^3 - t)\,dt$$

$$\left[\frac{-2t^4}{4} - \frac{t^2}{2} \right]_0^2$$

$$-\frac{2 \cdot 16}{4} - \frac{4}{2} = 0$$

$$-8 - 2 = -10$$

$$\int_0^3 (3t^2 + 2)\,dt$$

$$[t^3 + 2t]_0^2$$

$$t^3 + 2t^{2^2}_0$$

$$8 + 4 - 0 = 12$$

$$-10 + 12i$$

$25 - 4 \cdot 6 \cdot 2 \quad 2 - 3 = -1$

$\frac{5 \pm 1}{2 \cdot 1} \quad x - 3$

$\frac{(x-2)(x-3)}{x-2}$

$\frac{4 - 10 + 6}{4 - 2}, 2 - 2$

t^2

Digitalizado com CamScanner

$\frac{1}{(z+1)^3} - \frac{5}{z+i} + 8$ / a_z.

$f(z) = \frac{1}{w^3} - \frac{5}{w} + 8$.

$w^{-3} - 5w^{-1} + 8$.

$2\pi i\,|-5| = -10\pi i$.

$I = \int_C (z^2 - z + 2)\,dz$.

$z^2 = (t+i)^2 = t^2 + 2t(i) - i$

$\int_0^1 (t^2 + 2ti - t - i + 1)\,dt$.

$I\ 2 = \frac{1}{3} + \frac{1}{2} - \frac{2i}{1} = \frac{1}{2} - \frac{5i}{3}$.

$\frac{5}{6} + \left(\frac{1}{2} - \frac{5i}{3}\right) = \frac{4}{3} - \frac{5i}{3} = \frac{4-5i}{3}$

$z^2 + 2 = 0 \Rightarrow z^2 = -2 \quad z = \pm i\sqrt{2}$

Digitalizado com CamScanner

$|z - \frac{1}{2}| = 1$.

$\sqrt{\left(\frac{1}{2}\right)^2 + (1)^2} = 0,25 + 1 = \sqrt{1,25} = 1$

$z^2 + 2 = (z - i\sqrt{2})(z + i\sqrt{2})$.

$\frac{2z + 1}{(z - i\sqrt{2})(z + i\sqrt{2})}$

$\frac{2z}{2i\sqrt{2}} \cdot \frac{(z - i\sqrt{2}) + 1}{2i\sqrt{2}} = \frac{2i\sqrt{2} + 1}{2i\sqrt{2}}$.

$\frac{2(-i\sqrt{2}) + 1}{-2i\sqrt{2}}$.

(a) 0

(b) $\sqrt{2}\pi i$

(c) 0.

Digitalizado com CamScanner